

## INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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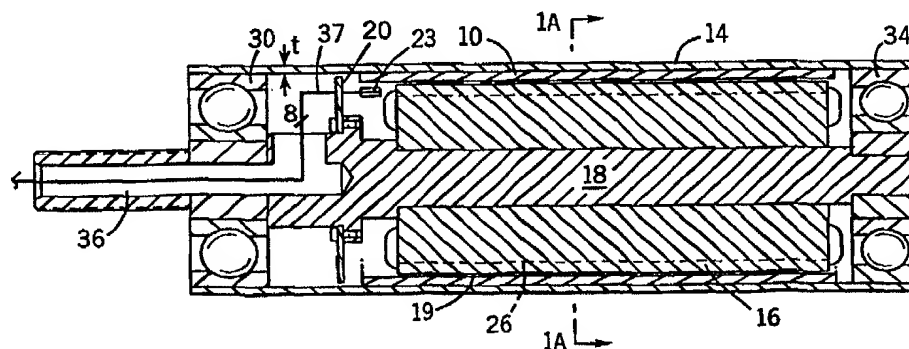
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**Published***With international search report.**Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.*

(54) Title: DIRECT DRIVE INSIDE-OUT BRUSHLESS ROLLER MOTOR

**(57) Abstract**

A brushless d.c. motor is integrated with a conveyor roller (14) by placing a plurality of stator coils (15) on a stationary shaft (18) and securing a rotor (10) with segments (12) of permanent magnetic material to the inside of the conveyor roller (14). In one embodiment the rotor (10) is directly secured to the roller while in a second embodiment, the rotor (10) is disposed inside of a cylindrical metal housing (40) that is press fit inside of the roller. Commutation is provided by an external motor controller (54) which is connected by conductors (37) through a passageway (36) in the shaft (18) to a circuit board (20), where sensors (23) are mounted to sense rotor position for purposes of commutation of the stator coils (15).

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(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference	<b>FOR FURTHER ACTION</b> see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.	
International application No.	International filing date (day/month/year)	(Earliest) Priority Date (day/month/year)
PCT/US 99/ 13145	11/06/1999	11/06/1998
Applicant		
ASPEN MOTION TECHNOLOGIES, INC. et al.		

This International Search Report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This International Search Report consists of a total of 3 sheets.

☒ It is also accompanied by a copy of each prior art document cited in this report.

### 1. Basis of the report

a. With regard to the **language**, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

☐ the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

b. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international search was carried out on the basis of the sequence listing :

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2. ☐ **Certain claims were found unsearchable** (See Box I).

3. ☐ **Unity of invention is lacking** (see Box II).

4. With regard to the **title**,

☒ the text is approved as submitted by the applicant.

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5. With regard to the **abstract**,

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6. The figure of the **drawings** to be published with the abstract is Figure No.

☒ as suggested by the applicant.

☐ because the applicant failed to suggest a figure.

☐ because this figure better characterizes the invention.

1

☐ None of the figures.

## INTERNATIONAL SEARCH REPORT

International Application No.

PCT/US 99/13145

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 6 H02K7/10 H02K21/22 B65G23/08 B65H27/00

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 6 B65G H02K E06B D01H G03G B41F B65H

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
E	US 5 918 728 A (SYVERSON) 6 July 1999 (1999-07-06) abstract column 3, line 2 -column 4, line 8; figure 1	1-7, 10
P, X	US 5 852 897 A (SUKALE) 29 December 1998 (1998-12-29) abstract column 2, line 36-62; figure 2	1, 2, 4-7, 10
X	& WO 98 04801 A (INVENTIO AG)	1, 2, 4-7, 10
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Date of the actual completion of the international search

30 September 1999

Date of mailing of the international search report

07/10/1999

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## INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 99/13145

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 524 805 A (SHIBA ET AL.) 11 June 1996 (1996-06-11) abstract column 4, line 1-16 column 4, line 30-42 column 6, line 17-40 column 6, line 62 -column 7, line 40; figures 1,2,4-6 ---	1,2,4,7, 10
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Information on patent family members



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Inter. Patent Application No  
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**C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT**

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 524 805 A (SHIBA ET AL.) 11 June 1996 (1996-06-11) abstract column 4, line 1-16 column 4, line 30-42 column 6, line 17-40 column 6, line 62 -column 7, line 40; figures 1,2,4-6	1,2,4,7, 10
X	DE 298 02 297 U (MAN ROLAND DRUCKMASCHINEN AG) 16 April 1998 (1998-04-16) the whole document	1,4,5,7, 10
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